# Teacher professional development: Use of data to guide instruction

Benefit-cost estimates updated December 2014. Literature review updated June 2014.

Current estimates replace old estimates. Numbers will change over time as a result of model inputs and monetization methods.

The WSIPP benefit-cost analysis examines, on an apples-to-apples basis, the monetary value of programs or policies to determine whether the benefits from the program exceed its costs. WSIPP's research approach to identifying evidence-based programs and policies has three main steps. First, we determine "what works" (and what does not work) to improve outcomes using a statistical technique called meta-analysis. Second, we calculate whether the benefits of a program exceed its costs. Third, we estimate the risk of investing in a program by testing the sensitivity of our results. For more detail on our methods, see our technical documentation.

Program Description: One form of teacher professional development (PD) involves training teachers how to use student academic assessment data to modify and improve instruction. This type of PD is usually paired with computer software that tracks and reports student assessment data to teachers. The specific types of assessments and software that have been evaluated and are included in this meta-analysis are (in no particular order): ISI (Individualized Student Instruction) using A2i software, Data-Driven District (3D), mCLASS/Acuity, Looking at Student Work, Formative Assessments of Student Thinking in Reading (FAST-R), and 4sight.

## Benefit-Cost Summary

| Program benefits | |
|---|---|
| Participants | $6,973 |
| Taxpayers | $3,221 |
| Other (1) | $3,288 |
| Other (2) | $64 |
| Total | $13,546 |
| Costs | ($107) |
| Benefits minus cost | $13,439 |

| Summary statistics | |
|---|---|
| Benefit to cost ratio | $126.97 |
| Benefits minus costs | $13,439 |
| Probability of a positive net present value | 100 % |

The estimates shown are present value, life cycle benefits and costs. All dollars are expressed in the base year chosen for this analysis (2013). The economic discount rates and other relevant parameters are described in our technical documentation.

## Detailed Monetary Benefit Estimates

| Source of benefits | Benefits to Participants | Taxpayers | Other (1) | Other (2) | Total benefits |
|---|---|---|---|---|---|
| From primary participant | | | | | |
| Crime | $0 | $0 | $1 | $0 | $2 |
| Labor market earnings (test scores) | $7,003 | $2,987 | $3,459 | $0 | $13,449 |
| Health care (educational attainment) | ($30) | $234 | ($173) | $117 | $149 |
| Adjustment for deadweight cost of program | $0 | $0 | $0 | ($54) | ($54) |
| Totals | $6,973 | $3,221 | $3,288 | $64 | $13,546 |

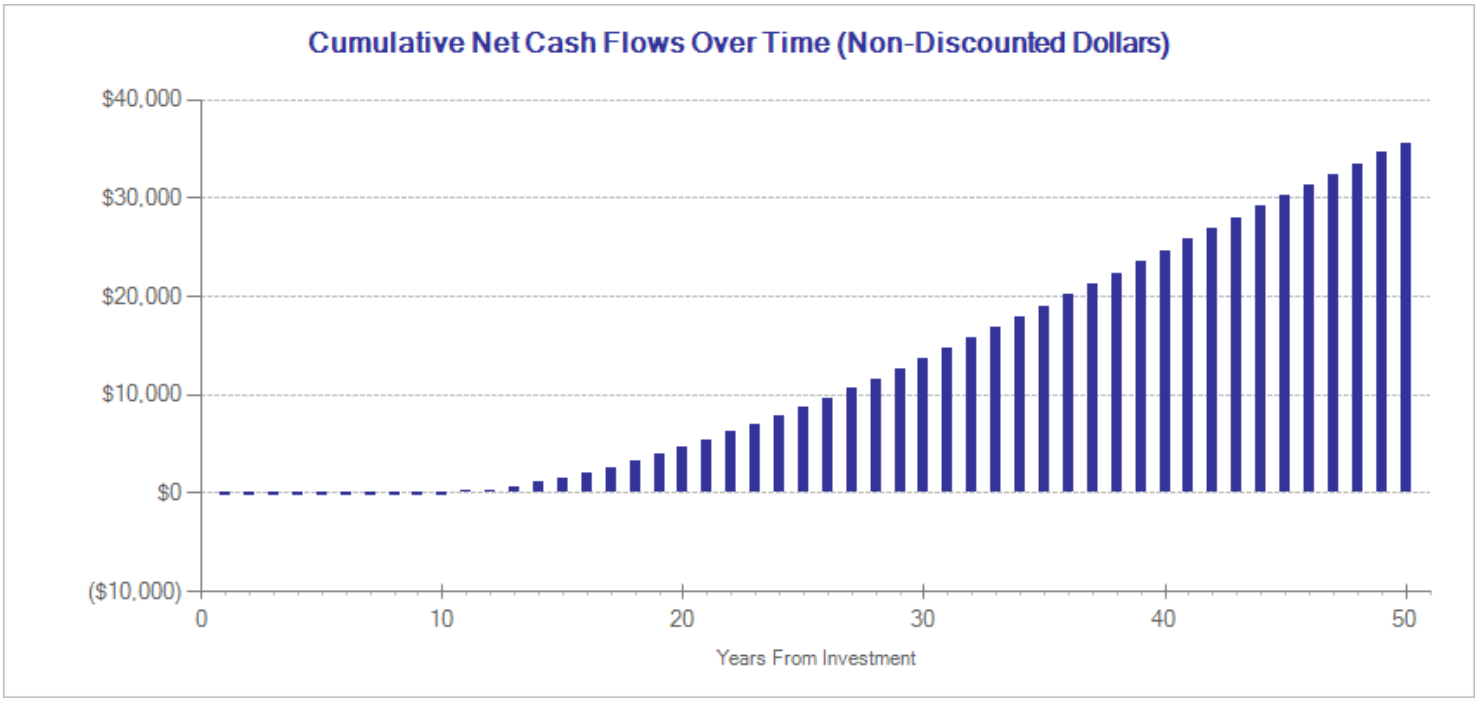
We created the two “other” categories to report results that do not fit neatly in the “participant” or “taxpayer” perspectives. In the “Other (1)” category we include the benefits of reductions in crime victimization and the economic spillover benefits of improvement in human capital outcomes. In the “Other (2)” category we include estimates of the net changes in the value of a statistical life and net changes in the deadweight costs of taxation.

## Detailed Cost Estimates

| | Annual cost | Program duration | Year dollars | Summary statistics | |
|---|---|---|---|---|---|
| Program costs | $107 | 1 | 2013 | Present value of net program costs (in 2013 dollars) | ($107) |
| Comparison costs | $0 | 1 | 2013 | Uncertainty (+ or - %) | 10 % |

In the evaluations included in the meta-analysis, teachers received an average of 26 hours of training in how to use student assessment data to guide instruction. We calculate the value of PD time using average teacher salaries (including benefits) in Washington State as reported by the Office of Superintendent of Public Instruction. To calculate a per-student annual cost, we divide compensation costs by the number of students per classroom in Washington's prototypical schools formula and add per-student materials, supplies, and operating costs.

The figures shown are estimates of the costs to implement programs in Washington. The comparison group costs reflect either no treatment or treatment as usual, depending on how effect sizes were calculated in the meta analysis. The uncertainty range is used in Monte Carlo risk analysis, described in our technical documentation.



## Meta-Analysis of Program Effects

| Outcomes measured | Primary or secondary participant | No. of effect sizes | Treatment N | Unadjusted effect size (random effects model) | | Adjusted effect sizes and standard errors used in the benefit-cost analysis | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | First time ES is estimated | | | Second time ES is estimated | | |
| | | | | ES | p-value | ES | SE | Age | ES | SE | Age |
| Test scores | Primary | 8 | 867 | 0.210 | 0.001 | 0.162 | 0.030 | 10 | 0.107 | 0.033 | 17 |
| High school grad via test scores | Primary | n/a | 0 | n/a | n/a | 0.028 | 0.009 | 18 | 0.028 | 0.009 | 18 |

## Citations Used in the Meta-Analysis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